Abstract

A method and apparatus are provided for detecting a frequency of an optical signal within a communications channel having a plurality of optical carriers separated by a predetermined frequency spacing. The method includes the steps of locking an optical carrier frequency to an axial mode of an optical resonator of known free spectral range; providing an additional optical resonator as a reference having a known free spectral range that differs from that of the first optical resonator; locking an optical reference signal to a closest axial mode of a reference optical resonator producing an optical reference signal that is spectrally offset from said optical carrier frequency by a spectral quantity less than the known free spectral range; mixing the optical carrier frequency with the reference optical signal frequency thus generating a difference signal as a beat frequency; and measuring a frequency of a difference signal.

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[1] R.G. DeVoe and R.G. Brewer, Laser-frequency division and stabilization, *Phys. Rev. A,* vol 30, no. 5, pp. 2827-9 (1984).